

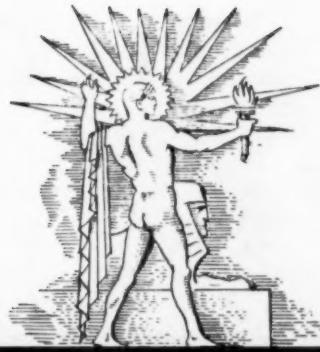
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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE•



May 27, 1939

In Man-Made Fog

See Page 326

A SCIENCE SERVICE PUBLICATION

Do You Know?

Of its 435 kinds of birds, Florida counts 174 as "permanent residents."

The Arctic regions are usually coldest just before the sun rises, that is, in late February and early March.

An audience of 500 deaf students recently watched a television broadcast at the Golden Gate Exposition.

Inquiries on how to feed pet crickets and keep them healthy have recently been received by a Cornell entomologist.

Composers are generally at the height of their genius between 35 and 40 years of age, according to a recent statistical study.

The mental age of children entering psychopathic hospital wards is sometimes rated by observing how completely they draw the human form.

A collection of 1,500 mineral and fossil specimens, which two British women made prior to the 1820's, has come to the Field Museum of Natural History.

A Stone Age woman whose skeleton was found in the Crimean Peninsula had the end joints of the little fingers cut off—a custom known in recent times among primitives.

An archaeologist says that it is often hard to judge how warlike prehistoric men were, because stone blades and points could serve for hunting and domestic use as well as for combat.

SCIENCE NEWS LETTER

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QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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POPULATION

Is there less employment now than there was in January, 1930? p. 329.

PUBLIC HEALTH

What improvements in public health has 1939 already brought? p. 328.

To light up a dial phone, non-glare, seven-watt lights have been devised.

The London Zoo's baby giant panda, Ming, gets exercise by romping with a well-trained Alsatian dog.

A population expert figures that 52.5 per cent of the earth's inhabitants are living on a little over five per cent of the land area.

Fresh-harvested potatoes contain more vitamin C than potatoes kept in storage a month or longer.

A thick stand of cattails, willows and alders along a small brook or irrigation ditch may drink it dry.

To provide Stanford Museum with material for a coral scene, Florida divers collected a ton and a half of coral.

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MEDICINE

Chemicals Give Hope Dreaded Heart Ills Can be Conquered

Work Through Influence on Reflex Nerve Action; Pain of Angina Abolished, Deaths Reduced by Third

HOPES that such dreaded heart ailments as angina pectoris and coronary thrombosis can be conquered by chemical remedies is held out by discoveries announced by Dr. G. E. Hall, of the University of Toronto, at the meeting of the American Medical Association.

The exact chemical that will be used has not yet been determined. It may be atropine, familiar as the "drops" doctors put in your eyes before testing your vision. This drug has shown some life-saving possibilities in dogs with experimental heart disease. More likely, Dr. Hall said, the chemical treatment used for human heart sufferers will be a combination of atropine with some other drug or chemical.

The chemicals must be the kind that can produce results by their effect on certain sets of nerves, because a reflex nerve action, Dr. Hall has found, is probably responsible for sudden deaths from heart disease with or without evidence of the disease of the heart's arteries known as coronary thrombosis.

People likely to have a heart attack from mild exertion, cold air, worry or anxiety, as is the case with sufferers from angina and coronary thrombosis, probably have a more sensitive reflex nerve mechanism than the average person.

Existence of this reflex nerve mechanism was discovered by Dr. Hall in studies of dogs that could be given "heart disease" by cutting off the artery that supplies the heart muscle with blood. The reflex is from the afferent nerves leading away from the heart and producing the sensation of pain in angina, to the vagal nerves that lead to and stimulate constriction of the smaller arteries in the heart's muscle.

When this reflex was abolished, either by cutting the pain nerves or by ether anesthesia, the animals with the simulated heart disease had no pain. The deaths were reduced from 75 per cent. to 25 per cent. in the nerve cutting procedure, and from 50 per cent. to one per cent. when the pain nerves were put out of action by the anesthetic. Atro-

pine abolished the reflex nerve action to some extent, as shown by reduction in pain and in deaths.

A Boston surgeon has been getting similar results in human patients, Dr. Hall said, by cutting some of the nerves and thus abolishing the reflex. Dr. Hall hopes that a chemical can be found to accomplish the same end without resort to the hazards of an operation on nerves connected with the heart.

The reflex nerve mechanism, starting with the pain nerves, causes a spasm of the small blood vessels which cuts down the blood supply to the heart, Dr. Hall believes. In coronary thrombosis this blood supply is already reduced and further reduction is likely to stop the heart completely. Sudden and often fatal heart attacks in patients who have not had coronary thrombosis is probably caused by a spasm set up by the same reflex nerve mechanism.

Science News Letter, May 27, 1939

Cancer Solution Promised

SOLUTION of the cancer problem, so far as the cause of breast cancer is concerned, seems promised by a method presented by Dr. Charles Gesickter, of the Johns Hopkins Hospital, Baltimore. "A method for determining the ultimate mechanism by which mammary cancer develops in humans" has been obtained, Dr. Gesickter said, by the studies he has made on rats.

Working with a strain of rats which normally never have breast cancers, Dr. Gesickter produced such cancers in the animals by large doses of a female sex hormone. All forms of breast cancers can be produced in the rats by this gland product because, as Dr. Gesickter explained it, the hormone constitutes a physiologic agent which can be used to upset normal growth.

This hormone or gland product is being used to treat certain glandular disorders in women, but there is no danger of its causing cancer, Dr. Gesickter said, because the doses used in treatment are much smaller (*Turn to Page 332*)



HOT LIGHTNING

Now man-made lightning, like Nature's bolts, can set fires, it has been demonstrated by Westinghouse.

PHYSICS

"Assembly Line" Production Of Artificial Lightning

ASSEMBLY-LINE production of artificial lightning for routine testing of all transformers to make sure, as they are completed, that they can withstand natural lightning bolts when in service, and artificial creation of "hot" lightning, the kind which sets fires, are announced by the Westinghouse Electric and Manufacturing Company as the two latest achievements in man's struggle to capture and conquer lightning.

Great 1,500,000-volt 80,000-ampere bolts of lightning are now crashing down onto every transformer to make sure it is able safely to bypass the bolt without damage to its essential electrical circuits, as it will be called upon to do when out in service on the line.

And now for the first time, through the work of P. L. Bellaschi, an artificial lightning bolt which imitates natural lightning in its ability to set fires has also been created. It differs from the conventional artificial bolt in having a low-temperature, long-duration stroke following the main and leader lightning discharges, similarly to natural lightning.

Although the heat of previous artificial bolts is intense and they have

enormously destructive explosive effects on whatever they hit unless it is adequately protected, they did not last long enough to set fire to combustible targets, only leaving a scorched hole. The after-stroke of "hot" lightning generates temperatures only half as high as the main stroke, but it lasts between 100 and 1,000 times as long.

The long-duration charge is produced by means of additional capacitors or a transformer from which the charge is "soaked" through a series of resistance and inductance coils in oil and permitted to follow the initial high current discharge relatively slowly.

In demonstrations, "hot lightning" fused sand in a fiber tube, set fire to cotton cloth, and burned holes through copper sheets varying from one thirty-second to one-sixteenth of an inch thick.

Science News Letter, May 27, 1939

MEDICINE

Cancer Control Attempted Through Use of Insulin

THE POSSIBILITY of controlling cancer in the future by means of insulin, now used in diabetes treatment, is hinted in two reports to the Society for the Study of Internal Secretions.

None of the work has yet reached the stage where insulin can be recommended for human cancers. But the studies show that scientists are trying all possible methods in the search for more weapons to fight this great killer.

A University of Rochester group studied two lots of rabbits which all had tumors of the same average size in the beginning. One lot got insulin and the other did not. There were always, even in the non-insulin group, a few spontaneous regressions of the cancers. But there were always a few more regressions of the malignant growth in the rabbits that got insulin. The insulin-treated animals always gained more weight than the controls and it was suggested that this improved nutrition might have been the determining factor in reducing the size of the cancers, rather than any direct effect on their growth by the reduced amount of sugar in the blood.

The attempts at controlling cancers in animals, with a degree of success in some cases, were described by two groups of investigators: Drs. John R. Murlin, C. D. Kochakian, T. B. Steinhausen and R. Ryer of the University of Rochester, and Drs. Milton O. Lee, William Freeman, R. G. Hoskins and Helen M. Levine of Harvard Medical School.

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AERONAUTICS

Air Giants of Future May Carry Own Oil Refineries

AIR GIANTS on the skyways of the future may carry their own petroleum cracking refineries aloft, it was suggested at the meeting of the American Petroleum Institute by S. D. Heron and Harold A. Beatty of the Ethyl Gasoline Corporation.

Increasingly aviation is demanding more powerful fuels, said the oil experts, but at the same time it is rightly asking for safer fuels which will decrease the menace of fire.

Safety fuels that ignite less easily and which burn more slowly than gasoline are the answer to this need. However, such fuels can be burned either in Diesel engines or in spark-ignition engines only after the latter are in operation.

"Engines operated on safety fuel require either gaseous or volatile liquid fuel for starting," declared the petroleum experts. Unless these starting fuels are carried with great precautions they may greatly increase the low fire risk inherent in the safety fuels. If they are carried in heavy tanks like those used in storing oxygen under pressure they add weight.

AERONAUTICS

Pick-Up Airmail Service For Towns With No Airports

ONE of aviation's fondest dreams—of a day when all first class mail goes by air—moved a step nearer realization when a United States airmail plane dropped low over ten Pennsylvania, Ohio and West Virginia towns for the first time in their histories to launch an experimental pick-up airmail service.

Carrying no revenue load except mail, a fleet of five trim monoplanes of All-American Aviation, Inc., will in a few weeks' time be serving 56 cities in four states with speedy letter service such as no small American city has ever had.

If the novel experiment, backed by Federal funds to the extent of 43 cents a mile on one route and 32 cents on the other, is successful during the course of the next year, and Congress approves, it will be extended to hundreds of other

"It might be practicable to install a small electrically-heated cracking unit to crack either safety fuel or engine lubricating oil to a fixed gas (for starting)," the experts said.

"Even though such a unit were of considerable size and weight, it still would probably be lighter than special pressure tanks for volatile or gaseous fuels; and it would avoid the manufacture, distribution, and storage of special starting fuels (in event that fuels other than gasoline were used for this purpose)."

"The average layman has been led to believe that the use of Diesel engines is practically a cure-all for this problem (fire hazard), but to the aircraft operator or designer the solution does not appear to be so delightfully simple," they added.

Current handicap of aircraft Diesels is that no 1,000 horsepower units have yet been seen in the United States, whereas spark-ignition engines giving 1,200 and 1,500 horsepower are commonplace and 2,000 horsepower units are now in demand, the petroleum experts concluded.

Science News Letter, May 27, 1939

cities throughout the United States and rapidly bring nearer the day when first class mail all goes the fastest way possible—through the air.

Several unique devices developed by an Irwin, Pa., dentist who became interested in aviation, Dr. Lytle S. Adams, underlie the new service which dispenses with the necessity of making landings to pick up letters and other packages, or to deliver them.

A mail bag will be slung between two masts 40 feet high. As the mail plane approaches, an operator aboard the ship will lower a 65-foot cable at the end of which is a grasping hook, and at the end of another 20 feet, a container of mail for delivery to that town.

As the bag being delivered touches ground, a special device will sever the copper wire by which it is fastened. An

instant later, the hook on the cable will snare the rope holding the container of outgoing mail. Service is thus possible in towns too small to afford excellent airports.

Another important aeronautical promise is also implicit in the All-American service, which is headed and financed by Richard C. du Pont, glider pilot. For, if these planes which carry no passengers can be made to pay for them-

selves, and if all first class mail ever does go via air, a day will come when passengers and mails will go in separate planes.

Two routes are to be operated, covering the 56 small cities. One will go from Philadelphia to Pittsburgh, with mail pick-up and delivery at 26 intermediate points. The other will run from Pittsburgh to Weston, W. Va., with 30 intermediate stops.

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AERONAUTICS

Life Raft for Planes; Can Support 20 People

A NEW type of virtually unsinkable pneumatic life raft, designed to prevent repetition of forced landings by over-water planes as in the case of the British Cavalier several months ago with tragic consequences, is announced by U. S. Army Air Corps engineers at Wright Field. Larger than previous types, the new "rubber boat" will accommodate ten passengers and will provide sufficient buoyancy to support ten additional men clinging to lifelines attached to the boat.

A latex rubber bladder, canvas covered, supports the boat, the bottom of which is of heavy rubberized duck fabric, and contains three pneumatic inflatable seats. Valves and manifolds are provided on the latex bladder for inflation by carbon dioxide gas, and cylinders of this gas are attached. About five pounds of the gas are required for complete inflation.

The life raft is equipped with a pump and repair kit to patch leaks, so that the raft under ordinary circumstances will remain afloat almost indefinitely. Waterproof containers attached to the raft contain four army canteens of water, emergency rations, an emergency signal kit with six red flares, and a flare pistol. The raft may be rowed by four

PHYSICS

Audience Given a Deafness In Mass Demonstration

Sounds Barely Perceived Against Noise Background Become Clearly Audible When Distraction is Removed

CIENTISTS at the meeting of the Acoustical Society of America were made deaf en masse for a time and learned how one type of deafness appears to the afflicted.

Dr. Harvey Fletcher, acoustical expert of the Bell Telephone Laboratories, put on the show which every person with normal hearing ought to hear to learn the problems of those who live in a world of ringing bells, sirens, waterfalls and murmurs of voices.

While many deaf people hear no sounds, others have a kind of nerve deafness which produces sensations of noise in their head.

Day and night bells may ring, sirens may grind out their shrilling noises, the roar of waterfalls may be heard or even—in some cases—actual voices seem to be murmuring in a distracting background of sound.

To his audience, Dr. Fletcher brought such sounds by loud speakers in the auditorium and then, superimposed on this background of extraneous noise, he added simple speech, music and other understandable sounds.

Like the deaf people, members of the audience experienced great difficulty in hearing under this condition. Then suddenly, by removing the background of noise, Dr. Fletcher showed that the articulate speech which they had been trying to hear was really roaring at them as one might shout at a deaf person.

The ringing sounds in the heads of deaf people have been known to cause some eventually to commit suicide. While there has been no certain knowledge, it has been suggested that in some

cases the "voices" which famous characters of history have heard—like some of the saints and Martin Luther—may have been due to this type of deafness which produced head noises interpretable as ever-present voices. Luther's encounter with the Devil in which he hurled the inkpot at Satan may have had this physical interpretation.

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(Turn to Page 335)



TEN MEN IN A BOAT

This official photograph of the U. S. Army Air Corps shows how their new collapsible rubber air raft carries ten men to safety. Earlier rafts of this sort could hold only two.

two-section metal oars which are strapped in place.

The new rubber boat is much more easily rowed and maneuvered than older and smaller boats, according to Wright Field engineers. When deflated and folded the craft occupies approximately three cubic feet of space.

The Air Corps plans to use it as standard equipment on its big four-engined bombers, when they fly overwater, but it will probably be made available soon to commercial airlines. Tests on the new boat have been completed, and an order has already been placed for a service test quantity, amount of which was not disclosed.

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Government engineers say that a small opening, such as the crack under a door, will almost completely destroy the sound insulating value of any wall.

Germany has ordered that universities and technical schools turn out engineers faster, by shortening the courses.

TIMES ARE CHANGING!

The gas mask has been improved in function but not in beauty or its grim reminder of the frailty of man. From left to right are shown: The handkerchief soaked in hypo that served the British against the German's chlorine. The Ku-Klux-looking outfit is a later development of the British in the World War. The feedbag-looking mask is of Italian make. On the facing page, at left, the new type U. S. Army mask with replaceable aviator goggles and ventilation to remove moisture. Next the new Navy mask with a diaphragm to permit speech. At right, a new mask of synthetic rubber-like material, Koroseal, transparent and with improved circulation of air to keep goggles free of fogging.

CHEMISTRY

Edgewood Arsenal Prepares For New Defense Program

Gas Masks Are Special Feature; Production Could be Speeded Up to 300,000 a Month With Present Plant

See Front Cover

A WITHERED skeleton of a mighty World War industry, which poured its products across the sea to the allies by the millions of units and then dried up when peace-time came, is coming to life again in a small Maryland town as Uncle Sam's new defense program swings into action on land and sea and in the air.

Gas masks for the Army! Smoke screens for the soldiers! Chemical shells and gas America hopes she will never use but is preparing anyway! That's the business of Edgewood's famous arsenal, busy as it has not been in many a year, a sprawling institution where experimental and pilot plants are being studied today to serve as guides for tremendous industries that may have to spring up overnight tomorrow.

You can see some of it today, if you have proper permission, and are in the custody of a watchful Chemical Warfare Service officer, but it is becoming a bit more mysterious than ever as a spreading air of secrecy masks its work.

Some buildings are relics of World War days. Everywhere, however, you will see huge concrete foundations that

once supported enormous tanks of chemicals. Wherever you look are the network of pipes that once linked these tanks with buildings and buildings with each other. Through these pipes—ten feet off the ground—once flowed concoctions of death through poison gas. And they can do it again.

At Edgewood you learn that the term "poison gas" is little used in the service. Chemical agent is the characteristic term for everything from mustard gas to the sneezing and crying gases that go by the technical names of sternutators and lachrymators.

If the wind is right you will hear, at Edgewood, the dull booms of distant guns as chemical mortars, Livens projectors and their newer fellows shoot gas and smoke shells in nearby Bell Farm Test Field, hard by the shores of Chesapeake Bay. When the Army gets to work on its big guns at Aberdeen Proving Ground down the road toward Wilmington, you can really hear the big fellows roar.

The illustration on the front cover of this week's SCIENCE NEWS LETTER shows a smoke screen spread to cover movement of troops.

Any civilian visitor at Edgewood will



make for the gas mask factory for two reasons. In America—as yet—thanks be gas masks are a rarity and there is something of a Man-from-Mars aspect about them which intrigues the layman. Subconsciously perhaps the urge to visit the gas mask factory comes from the realization that here the civilian will probably find his closest reminder of what war is like.

Gas mask manufacture is one of Edgewood's chief activities. Eight hundred a day are being turned out by a skeleton force of 280—nearly all civilians and under Civil Service. These masks go to the Army and the Navy to replace old masks and to make possible a greater distribution of masks in the services, where the present ratio of masks to soldiers and sailors is about one mask for every four men.

Using the same plant, but by increasing personnel to 1,500 and by going on a 24-hour production day, it is estimated that 300,000 masks per month could be made at Edgewood.

Gas mask manufacture has come a long way since that shocking day in April, 1915, when a thin veil of haze swept over the landscape at Ypres and left in its wake a terrorized, shattered force of British and French soldiers.

The hastily-concocted handkerchiefs soaked in a solution of sodium thiosulfate, known also as hypo in photography, and tied over the mouth and nose, which the British used to gain some measure of safety from the original chlorine gas of the Germans, have now been replaced by masks that are proof against any known poison gas or dust.

The weight of the mask and its supplementary filtering canister has come down, its utility has gone up. It fits better, lasts longer and is more comfortable.

Clever placement of the intake duct splits the flow of air and makes it sweep across the eye-pieces of the masks to keep them free of breath fog.

Special masks are coming into production for all manner of jobs in the Army and Navy. Commissioned and non-commissioned officers are supplied with diaphragm masks which permit the sounds of commands to come out without letting in poison gas. Telephone operators of the signal corps, too, wear masks of

this type.

Some new masks have their eyepieces made to optical perfection so that the wearers can read delicate and sensitive instruments. Try reading the vernier settings on the range of a 75 millimeter gun while wearing an old-time gas mask and see how low is the accuracy of fire. Aviators need such special masks too because of the myriad of instruments before them in the cockpit.

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ARCHAEOLOGY

Indian Ears Preserved By Copper Earrings

INDIAN ears "preserved" by salts formed by their copper earrings after burial, and Indian skulls that were buried minus bodies by some strange prehistoric American custom, are among the finds salvaged by archaeologists from the Alabama T. V. A. area now flooded by waters of Wheeler Dam.

Rated highly important for reconstructing events in Southeastern states in America's prehistory, the excavations at 19 sites in this area are described in a report by Prof. William S. Webb, of the University of Kentucky, issued by the Smithsonian Institution.

The most primitive of the Indians whose homes now lie beneath the lake are described by Prof. Webb as having lived mainly on the bounty of the Tennessee River. They had no agriculture, no pottery, and did little hunting. They may have been cannibalistic, but the evidence is doubtful. They used a throwing

stick, similar to the atlatl of pre-bow and arrow days in some other sections of America, which may mean that these Indians lived many centuries ago.

Prof. Webb and his associates recorded every significant detail of Indian cultures they could find in the area to be flooded, because so far archaeologists admit they are far from understanding when and how various tribes and types of Indian culture left their mark on the aboriginal Southeast. Shell ornaments and other objects found in some of the Alabama burial mounds resemble articles used at the well-known Indian mound settlement of Etowah, Georgia, 100 miles east. At other Alabama sites, many articles unearthed suggest to experts the advanced Hopewellian Mound Builder culture in the Mississippi Valley. Links between these factions, whatever they were, are still missing.

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MEDICINE

Sulfanilamide Seems to Have Value For Smallpox

THE NEW drug sulfanilamide appears to have value in the treatment of smallpox.

Four cases in which it largely prevented the eruption from the disease are reported (*Journal, American Medical Association*, May 13) by Dr. Walter O. McCammon of Springfield, Ky.

Seven cases of smallpox recently came under the observation of Dr. McCammon. He used sulfanilamide in treating four, and there was only a slight eruption which soon disappeared. The patients were back at work a week sooner than were the other three cases which were treated symptomatically and in which the typical eruption of smallpox developed.

In an editorial the medical journal points out that no conclusions as to the value of sulfanilamide in preventing deaths from smallpox can be drawn from such a small number of cases.

Although smallpox is increasing (there were 14,355 cases reported last year) the disease is now mild.

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ENGINEERING

Reversed Speech Sounds Like Foreign Tongue

BY RECORDING human speech and then playing it backward, scientists are not only having a lot of fun but learning some new things about one of man's oldest means of communication with his fellows.

The first impression one has on listening to reversed speech is that the talker is speaking in a foreign language and very rapidly, reports E. W. Kellogg of the R.C.A. Manufacturing Company to the Acoustical Society of America. The strange inflections suggest Chinese or some equally unfamiliar tongue.

Even though the record may be made to repeat a single word over and over again and you know what the word is supposed to be, it is difficult to identify it by any sounds that you hear.

The reason for this, suggests Mr. Kellogg, is that when we talk few of us make the sounds we think we do. And many of the sounds that ought to be present are clipped or replaced by inexact substitutes.

We all talk so easily and without effort that we are like a mother who would recognize her baby despite its

very dirty face. We recognize mangled words, provided reasonable fractions of their characteristics are preserved.

A speed of speech which is easily intelligible in ordinary sequence becomes impossible if we stop to identify individual sounds in the words. And that is what we have to do when we hear reversed speech.

Thus it is possible to get further in learning about the reversibility of speech if we try to say a word "in reverse" and then listen to the result. Try "world" and pronounce it "dlrw." You can omit the "o" because it is usually greatly slighted in pronunciation.

Mr. Kellogg, as a test, studied the number of ways the word Schenectady could be spelled and still be recognized in speech. The answer—as Ripley will perhaps some day tell you—is 1,125.

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PUBLIC HEALTH

Predict Good Health For Rest of Year 1939

BARRING war or some other great catastrophe, a good health record for the year 1939 is predicted by statisticians of the Metropolitan Life Insurance Company. The prediction is based on the health record for the first quarter of the year, which is considered a reliable forecast because the mortality during the winter months is almost always higher than at any other season.

The 1939 record, however, will not measure up to the low mortality record established in 1938. The death rate for the first three months of the year is already higher than for the corresponding period of 1938. Part of this has come from an increase in deaths attributed to influenza.

Deaths from diabetes and from heart disease were also higher during the first quarter of 1939 than 1938. The death rate for diseases of the coronary (heart) arteries will almost certainly reach a new high figure in 1939.

The death rate for syphilis is down 3.3 per cent. All the principal communicable diseases of childhood except whooping cough caused fewer deaths in the first quarter of 1939. Tuberculosis deaths were slightly lower. Deaths from diarrheal conditions and conditions associated with childbirth were significantly lower.

Suicide, homicide, accident and automobile accident deaths were also lower during the period surveyed.

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IN SCIENCE

PLANT PHYSIOLOGY

Seedless Watermelons By Chemical Treatment

Seedless watermelons have been produced in the greenhouses of Michigan State College, by treating the ovaries of unpollinated flowers with the growth-promoting chemical, naphthalene acetic acid. The feat was performed by a Chinese botanist, Cheong-yin Wong, who describes his results in *Science*. (May 5)

Besides the seedless watermelons, Mr. Wong has also produced seedless cucumbers and seedless green peppers by the same treatment.

Some of the "fatherless" fruits that developed after the chemical stimulation of the fruit-forming parts of the flowers did not achieve full size or normal shape; others, however, were completely normal except for the absence of seeds.

Mr. Wong reports of them: "The texture of these fruits was very solid and firm. No difference in flavor could be detected from normally pollinated fruits."

Science News Letter, May 27, 1939

CHEMISTRY

Makes Superior Fuel From Little-Valued Lignite

ALTHOUGH not yet applied on a commercial scale, industrial chemistry has perfected a means of producing an improved fuel from virtually valueless lignite, or brown coal, it was reported to the meeting of the American Institute of Chemical Engineers by Prof. E. P. Schoch of the University of Texas.

By heating mixtures of lignite and light petroleum oil in a closed vessel, the large amounts of water in the original materials are removed. The resulting fuel compares with soft coal in heating value.

Prof. Schoch estimates that a plant constructed to produce 231 tons of the lignite fuel each day could do so at a cost of \$3.15 for ton of fuel created. The product would have a heating value of 11,000 B. T. U. (British thermal units) to the pound and would compare with coal at \$4.05 a ton and a heating value of 14,000 B. T. U.

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SCIENCE FIELDS

BIOLOGY

Sponge Epidemic Traced To Fungus-Like Organism

THE HIGHLY destructive epidemic that has almost wiped out the sponge fisheries of Bahama-South Florida waters appears to have been due to a fungus-like organism, it is reported. (*Nature*, May 13) The report is signed by an international investigating committee composed of Paul S. Galtsoff, U. S. Bureau of Fisheries, and Hubert H. Brown, C. Leslie Smith and F. G. Walton Smith, Sponge Fishery Investigations, Nassau, N. P., Bahamas.

The threads of the fungus-like organism were found in the flesh of sick and dying sponges, but not in healthy sponges or in those long dead. It does not seem to affect other forms of marine life.

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GENERAL SCIENCE

Vernon Kellogg, 1867-1937, Comments on Germany

FRİENDS of Vernon Kellogg have brought together words and memories into a beautiful book—a memorial he would have liked. Dr. Vernon Kellogg, a great biologist and a pioneer trustee of Science Service, lived 70 eventful years that ended two years ago. From the leaves of this volume, there comes pertinent comment on European affairs so pointed to today's news that one realizes that while time passes philosophical ideas persist.

Dr. Kellogg, during the World War in connection with Belgian relief, lived at German GHQ, the heart of the German army. His "Headquarters Nights" recorded his experiences. Are not these words of his, from his memorial volume's excerpt from that record, comment on Germany today?

"There is a point of view that will never allow any land or people controlled by it to exist peacefully by the side of a people governed by our point of view. For their point of view does not permit of a live-and-let-live kind of carrying on . . .

"The creed of the *Allmacht* of a natural selection based on violent and fatal

competitive struggle is the gospel of the German intellectuals; all else is illusion and anathema . . .

"Struggle—bitter, ruthless struggle—is the rule among the different human groups. This struggle not only must go on, for that is the natural law, but it should go on, so that this natural law may work out in its cruel, inevitable way the salvation of the human species . . . That human group which is in the most advanced evolutionary stage as regards internal organization and form of social relationship is best, and should, for the sake of the species, be preserved at the expense of the less advanced, the less effective . . . This is the disheartening kind of argument that I faced . . . Add the assumption that the Germans are the chosen race, and German social and political organization the chosen type of human community life, and you have a wall of logic and conviction that you can break your head against but can never shatter—by headwork. You long for the muscles of Samson."

Science News Letter, May 27, 1939

MEDICINE

House Mice Indicted As Nerve Disease Carriers

COMMON gray house mice are accused of new wickedness—carrying the virus of a central nervous system disease and transmitting it to human residents in the house.

Corraling mouse suspects from two Washington homes in which this disease, choriomeningitis, has appeared, Dr. Charles Armstrong, senior surgeon of the U. S. Public Health Service, reports that the active virus of the disease was isolated in three out of five mice.

"The failure to find the infection in 21 mice trapped in eight homes and buildings wherein human cases had not occurred indicated that the association between the human cases and the infected mice is more than a coincidence," Dr. Armstrong stated.

The disease, characterized by acute onset, headache, nausea or vomiting, stiff neck and moderate rising fever, is usually followed by recovery in ten days to two weeks, without any paralysis or nerve complications remaining as an after-effect.

That the mice gave the disease to humans, not vice versa, is indicated by the fact that the two patients, both housewives, were removed to a hospital after only four days. The Public Health Service considers it would be remarkable for both cases to infect mice so quickly.

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PHYSICS

Self-Steering Rockets Use Tiny Gyroscopes

TINY gyroscopes—midget versions of the gyroscopes used to minimize roll on great ocean liners and which make possible the artificial horizon of the aviator's cockpit—are now being used to control the direction of rocket flight at the isolated laboratory of Prof. Robert Goddard at Roswell, N. M.

Prof. Goddard, Clark University physicist on leave, is supported in his rocket researches with funds from the Carnegie Institution of Washington and the Guggenheim Foundation.

The Goddard rocket gyroscopes are set to apply a controlling force when the long axis of the rocket deviates more than ten degrees from the vertical. Initial experiments utilized the gyroscopic control only during the time of the propulsive gases which make the rocket rush upward with terrific speeds.

After that time the rocket continues onward and upward in a smooth curve. Motion pictures of rocket flight show the rocket shooting upward in a slowly wavering curve as it is corrected, first to the left and then to the right, for deviations.

It should be possible, Prof. Goddard has indicated, to apply a compressed air system in the rocket which would be controlled by the gyroscope and which would force the directing vanes out into the slip-stream of the rocket and further aid vertical flight.

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POPULATION

Employment Normal Again But Unemployment Double

ALTHOUGH employment has reached the 35,000,000 level of January, 1930, unemployment has more than doubled, Dr. T. J. Wooster, Jr., WPA population expert, told the Population Association of America.

The unemployment problem has doubled because over a million boys and girls are reaching working age each year. About 65 per cent. join the job-hunting ranks.

To solve America's unemployment problem of the next 20 years, work must be found not only for the 11,000,000 now out of work but also for an additional 19,500,000. Most of these young job seekers are growing up in rural regions.

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ASTRONOMY

Vega is Overhead

High in the East Shines Most Beautiful Star; Movement of Mars Will Interest Late June Star Gazers

By JAMES STOKLEY

MOST brilliant of the stars seen overhead on June evenings is Vega, high in the east in the constellation of Lyra the lyre. Just below is the northern cross, part of the figure of Cygnus the swan. Brightest star in the group is Deneb, toward the north and marking the top of the cross, now resting on its side. To the right, about as high, is Aquila the eagle. Here we find Altair, which can be identified because there is a fainter star just above it and another below.

These orbs are indicated on the accompanying maps, in which the heavens are pictured as they look at 10 o'clock (or 11 if you use daylight saving time), on June first and 9 o'clock on the fifteenth. They would look the same way at 8 o'clock on the thirtieth if you could see them at that hour, but you won't because the sky will then be too bright.

Still another bright star that, in this summer of two world's fairs takes us back to the Chicago Fair of six years ago, is visible high in the south. This, of course, is Arcturus, the light from which was used to open that fair. It is part of Bootes the bear-driver. And below this figure is that of Virgo the virgin, in which Spica appears. To the left of Virgo are the scales, Libra, with no star of the first magnitude. Then comes Scorpius the scorpion, with Antares shining red.

Twins Hard to See

Three other stars, which rank among the brightest in the sky, are also shown. One is Regulus, in Leo the Lion, occupying a position in the western sky about as high as that of Aquila to the east. Part of this constellation is in the shape of a hook and is called the sickle. The blade curves downwards; the handle, with Regulus at the end, is at the left. Our remaining two first magnitude stars are very low in the northwest, and will be rather difficult to see. Pollux, brighter of the twins, Gemini, is one; Capella, in Auriga the charioteer, is the other. An hour or two before the times of the maps, just as it is getting dark, they will be higher and more easily found.

There is no planet in a position this month to appear on the maps, but Mars is coming into the evening sky, rising before midnight. Mars is approaching very close to us, and in July will be closer than it has been at any time since 1924. It is in the constellation of Capricornus. This is next to Sagittarius the archer, which follows the curved tail of the scorpion across the sky. Mars is of magnitude minus 1.5, brighter than any star. It is not as brilliant as Jupiter, in the constellation of Pisces, which rises a little after midnight, of magnitude minus two.

Saturn, in Aries the ram, rises about three hours before the sun. It is yellow in color and pale compared to Mars and Jupiter, though still equal to a first magnitude star. Brightest of all is Venus, last of our morning "stars," which appears only about an hour before the sun after the dawn has started.

Summer Solstice

On June 22, at 2:40 a. m., eastern standard time, the sun reaches its farthest north position in the sky. This position, called the "summer solstice," marks the official start of the season of summer. After this the sun moves southward.

If you happen to be out late enough to watch Mars during these June evenings, you will be able to see a peculiar feature of its motion, one which was very puzzling to the ancients, and led them to a very involved theory to find an explanation. The stars are called fixed, because they remain in the same

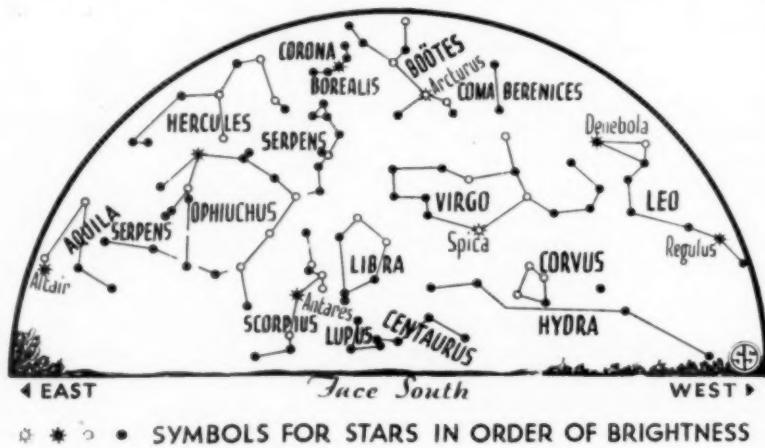
relative positions for centuries, as far as the naked eye can detect. But the planets, of which Mars is one, are "wanderers," they change their position from night to night. Note, for example, where Mars is this evening with relation to the stars about it. You might even make a small chart to show its place. Then, a few nights from now, look again, and you will find it has moved to the east. In recent months its motion has been continually eastward.

Motion Reversed

But during June, as you watch, you will find it slowing up, and then about June 24 there will be several evenings when no motion at all can be detected. After that, it will move in the opposite direction, to the west. If you keep on watching during the summer, you will find it still again, about August 24, after which it will be moving, as before, to the east.

Before the middle of the sixteenth century, it was the commonly accepted idea that the earth was the center of creation. The sun, the moon, Mars and the other planets all revolved around us. But why, then, should Mars, and the others, sometimes go to the east and occasionally to the west?

According to the theory of Ptolemy, which held sway for many centuries, the reason was that Mars moved, not around the earth itself, but in a circle, the center of which moved continually around the earth in a larger circle. In this way it went forwards or backwards, but always in motions that could be resolved into circles, most perfect of figures and the only ones thought appropriate for celestial bodies. At first this was not so bad,





but gradually more and more circles had to be introduced as new facts were learned about the planetary motions, and the system became most unwieldy.

In 1543 everything was simplified by the publication of the masterpiece of the Polish astronomer, Nicolaus Copernicus, a book generally known as "De Revolutionibus." This revived a suggestion made centuries before by Aristarchus, a Greek astronomer, that the sun is the center and the earth just one of the planets, revolving around it. Despite opposition, this theory prevailed, and now we know why part of this month Mars seems to move to the east, and during the rest of the month to the west.

We are observing it from a moving platform, for the earth moves around the sun at a speed of 18.5 miles per second. Farther out, Mars' speed is 15.1 miles per second. Thus, every time we are on the same side of the sun as Mars, we overtake it at a relative speed of 3.4 miles per second, and while we are doing this the planet seems to go the other way, to

"retrograde," as the astronomer says. In other words, the effect is similar to that observed by a person traveling along on an express train, and overtaking a slower freight train on the next track. Under such conditions, the freight may seem to be going backwards.

Celestial Time Table for June

Thursday, June 1, 10:11 p. m., full moon. **Tuesday, June 6**, 7:58 a. m., moon passes Mars, 17 lunar diameters to north. **Wednesday, June 7**, 4:00 a. m., Mercury on opposite side of sun; 6:00 p. m., moon farthest from earth—251,400 miles away. **Friday, June 9**, 11:07 p. m., moon in last quarter. **Sunday, June 11**, 11:45 a. m., moon passes Jupiter, 8.5 lunar diameters north. **Tuesday, June 13**, 6:34 a. m., moon passes Saturn, 6.5 lunar diameters north. **Saturday, June 17**, 8:37 a. m., new moon. **Monday, June 19**, 3:00 p. m., moon nearest earth, 225,800 miles away. **Thursday, June 22**, 2:40 a. m., sun farthest north—summer commences. **Friday, June 23**, 11:35 p. m., moon in first quarter. **Saturday, June 24**, 3:00 a. m., Mars stationary, after this moves to west instead of east.

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MEDICINE

Mystery of Leprosy And Tuberculosis

ONE of the unsolved questions in medicine and public health concerns the remarkable decline in leprosy in civilized countries since the Middle Ages. This horror of Biblical times still afflicts about 3,000,000 persons in various parts of the world. But in civilized countries it is so rare a disease as to be a medical curiosity. In the United States, for example, only about 30 deaths from leprosy are recorded each year out of an annual total of nearly 1,500,000 deaths.

Scientists would like to know exactly what has caused this decline in leprosy because, as public health experts of the Metropolitan Life Insurance Company point out, the answer might throw light on current medical problems, chiefly that of tuberculosis. This disease also seems on its way out, but if scientists knew just what happened to leprosy, they might be able to hasten further the elimination of tuberculosis, it is suggested.

The two diseases have many points in

common. Both are caused by germs belonging to the class of so-called acid-fast organisms. These germs seem to owe some of their properties to the fact that they have an outer coating of a waxy substance. Extensive modern chemical studies of the tuberculosis germ are throwing light on the properties of both this outer waxy coating and other parts of the tb germ.

Other resemblances between leprosy and tuberculosis are their moderate degree of infectiousness and the prolonged incubation period which makes it almost impossible to trace the source of the infection. Both diseases are very refractory to treatment and both tend to run a prolonged course. For both ailments institutional treatment with some degree of segregation is advisable, both to reduce the chances of spread and because this form of treatment is best for the patient.

Heredity predisposition seems to play a part in determining the victims of both diseases.

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ETHNOLOGY

Assyrians Know Customs Of Shepherd's Psalm

PROBABLY no Bible passage is so frequently explained as the Twenty-Third Psalm. And still the Western World has difficulty in realizing how completely the pictures of shepherd life suggest the fullness of living to the Near East.

A new small book by an Assyrian, who was a chief shepherd's son and who grew up to become an Episcopal theologian, presents the Assyrian ethnology—to view it from a scientific angle—of the well-known passage.

Nearly every one in Arabia, Palestine, and Mesopotamia knows something about sheep, because the desert people depend on sheep for a livelihood, explains Dr. George M. Lamsa, in *The Good Shepherd: The Twenty-Third Psalm*. (A. J. Holman Co.) But good shepherds are rare, and some become so famous that they are set up as examples to be emulated.

Sheep raising has been considered the highest occupation in that part of the world throughout the centuries, he continues. Experienced shepherds act as judges, arbitrators, instructors of young shepherds, musicians, legislators, and healers. Like statesmen, they make oral treaties with surrounding tribes.

"Indeed," says Dr. Lamsa, "a shep-

herd in a sheep camp is like a captain on an ocean liner. He is the sole ruler of the people and their flocks, and his word is law."

It was not so strange that ancient prophets and kings were called to leadership from tending sheep.

The feasting and brimming cup described in the psalm are typical of hospitality among Eastern nomads, says the Assyrian. Food for guests or strangers must be piled high and the dishes running over, lest they fear there is too little, and refuse to eat. Easterners even borrow from a neighbor to set forth a laden table for guests. And when an enemy comes to see if rumors of poverty are true—as is sometimes done—the hasty arrangement of a lavish meal wins admiration from the gossipy guest. He will at least leave pitying and admiring the family that keeps up its traditions of generosity in a hard time.

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than those used to produce the cancers in the rats. The development of cancer under the influence of this hormone, he added, all depends on conditions existing in the breast before the influence of the hormone is brought onto the scene.

Another female sex hormone can probably be used in a chemical test for distinguishing between breast cancer and another disease of the breasts, chronic cystic mastitis. The amount of this hormone, as measured by its excretion product, pregnandiol, is reduced in the cystic condition, Dr. Geschickter said.

A weapon against one form of heart disease, bacterial endocarditis, has been forged by two St. Louis physicians, Drs. Ralph Kinsella and R. O. Muether. By discovering a way to produce and cure the disease in animals, these doctors have presented medical science with a possible means of curing the ailment in man and with a means for further research for a cure if necessary.

Germs play a part in this heart ailment, which is a diseased condition of the heart valves. The disease can be produced in dogs exactly as it appears in man, the doctors found, by a mechanical injury to a heart valve followed by injection into a vein of germs of the streptococcus family. When induced in this way, the condition was invariably fatal.

Treatment with a chemical remedy, known by the trade name of merthiolate, saved half of a group of 24 animals. Sulfanilamide also proved an effective remedy against the ailment in dogs, but

its action was not as prompt as that of the other chemical.

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Artificial Heart

A N ARTIFICIAL lung and heart device with real life-saving possibilities made its debut before the American Medical Association meeting.

The mechanical steel cylinder and pumps of the apparatus have already doubled successfully for the living lungs and beating heart of a cat, keeping the animal alive for eighteen minutes while its own breathing apparatus was put temporarily out of commission by a surgical clamp which closed the artery supplying blood to the animal's lungs.

An attempt to save human lives with this artificial heart and lungs is the next step planned by the inventors, Drs. John H. Gibbon, Mary H. Gibbon and Charles Kraul, of the University of Pennsylvania Medical School.

Pulmonary embolism is the condition for which the apparatus holds promise of saving lives. This condition, in which a blood clot obstructs the artery leading to the lungs, causes two per cent. of all deaths. It is the condition most feared after surgical operations, killing about six out of every hundred persons who die after an operation. It develops unexpectedly and kills so rapidly that there is not time to do anything to save the patient.

Thousands of attempts have been made, Dr. Gibbon said, to save patients from this complication by slitting the artery and sucking out the blood clot. Of all the attempts, however, only about a dozen have ever succeeded. The extra time which the artificial heart and lungs can keep the patient alive, if it works as well with humans as with cats, may be enough to allow life-saving measures to be applied with a good chance for success.

The apparatus consists essentially of two pumps, one for arterial and one for venous blood, and a cylinder. The blood on its way from one pump to the other passes over this cylinder in a thin film, picking up life-essential oxygen which the blood normally gets from the lungs. The obstruction to its passage to the lungs in pulmonary embolism prevents this vital oxygen-collecting process, and the resulting oxygen starvation of the body is what makes the condition fatal. The apparatus is attached to a vein and to an artery, is primed by a small amount of blood from a donor, and then will carry the patient's own blood supply

through the oxygen-collecting circuit and back to his body.

Attempts by means of sedative drugs to save lives threatened by pulmonary embolism were reported by another group of investigators, Drs. Geza de Takats and George K. Fenn, of Chicago.

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Gas Mask For Oxygen

A N INVENTION which rivals the new chemical remedy, sulfa-nilamide, in its power to save lives and restore health to suffering patients was demonstrated by a group of Mayo Clinic physicians.

It is a new gas mask, for giving oxygen efficiently and economically. One of the famous Mayo Brothers, Dr. C. W. Mayo, and its inventors, Drs. Walter M. Boothby, W. R. Lovelace II, and A. H. Bulbulian, described its promising medical uses.

One patient desperately ill with rheumatic heart disease began to improve immediately when given one hundred per cent. oxygen with the new apparatus, although he had been expected to die. The treatment was not a cure, but an aid to the patient's fight to recover.

Patients suffering with gas gangrene and tetanus or lockjaw have been helped to recovery by oxygen given with this new type of mask. The recovery in these cases is due to the fact that both these ailments are caused by germs of the kind that cannot live in an atmosphere that contains oxygen. Giving the patient one hundred per cent. oxygen makes life very unpleasant for the germs and gives the patient a better chance to overcome them and get well.

The mask is also being used to give oxygen to patients in shock or collapse following injury or surgical operation, in cases of abdominal distention, for headaches following air injections into the brain for diagnosis of brain tumors, for migraine headaches, and for a number of lung disorders. The mask has already been installed on an airline for use of pilots and passengers threatened by oxygen lack at high altitudes.

The reason the new apparatus is finding such a wide field of usefulness is because it can be used in the patient's home as well as in large, well equipped hospitals and because it reduces enormously the cost of oxygen treatment. The cost of giving oxygen by oxygen tents, method used before invention of the new mask, is from \$12 to \$25 a day. This has prevented the use of oxygen

except in very few cases, chiefly severely ill pneumonia patients. With the new apparatus the cost of the oxygen should average only \$5 to \$8 a day.

The reduction in price, made possible by the efficiency of the apparatus, will enable doctors to use helium quite generally in treatment of asthma. Until six months ago, Dr. Boothby pointed out, helium was never used except for the most severe asthma cases, because of the high cost. With the new apparatus, both helium and oxygen can be used, starting with helium and as the patient gets better, increasing the proportion of the less expensive oxygen till the patient is getting all oxygen.

Tanks of pure helium should never be in a hospital ward or in a patient's room, Dr. Boothby warned, "or someone will be killed in two minutes." The danger is that the nurse or attendant might leave the patient breathing pure helium for a minute or two, while answering a knock at the door, for example. Complete lack of oxygen for even so short a time would prove fatal.

Besides the greater efficiency and lower cost, the new mask is not at all uncomfortable to wear. Only the nose is covered, so that the patient can talk and drink water, and if not too sick can sit up and read or carry on other activities. When helium is being given, the patient will find his speech sounds as if he were talking through his nose. This is because helium breathing, Dr. Boothby explained, causes an apparent change in the pitch of the voice.

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Must Attack Mental Illness

MENTAL illness and defect are the next great plagues in line for attack by medical men, Dr. Rock Sleyster, of Wauwatosa, Wis., said in his presidential address.

Hand-in-hand with the attack on these problems will come an understanding of

RADIO

Monday, June 5, 1939, 5:45 p. m. EDST

ADVENTURES IN SCIENCE with Watson Davis, Director of Science Service, will have as guest scientist Dr. Carl D. Anderson of California Institute of Technology, Nobel prizewinner in physics. Dr. Anderson will discuss cosmic rays and will also mention his important discovery of the positron, fundamental atomic particle. While cosmic ray researches have revealed new facts about the smallest things in the universe, they also promise to tell us in the near future important things about the largest things in the universe, the far-away nebulae and other astronomical bodies.

In the first part of the program Mr. Davis will report and interpret the latest news of science. Origination from WJSV, Washington, switching to KNX, Los Angeles, for Dr. Anderson.

man's mind to help solve problems of government, Dr. Sleyster pointed out.

"One by one the great plagues that used to devastate mankind are being overcome," he declared. "No longer does civilized man live in constant fear of cholera, smallpox and bubonic plague. Typhoid fever has become so rare that many a modern physician has never seen a case of this disease. . . . In our own time we have seen arsphenamine for syphilis, insulin for diabetes, liver for pernicious anemia, biologic preparations for pneumonia and scarlet fever, sulfa-nilamide and sulfapyridine for streptococcal and pneumococcal and similar infections. . . . We have seen the life expectancy rise from 40 years at birth to 62 years. What fields remain to be conquered?

"Among the problems which yet confront us, mental defect and mental disease are increasingly significant. They are imposing in their scope. An understanding of the human mind and of human thinking may aid in the solution of problems of government."

The 1,300,000 Americans who, Dr. Sleyster estimates, are on any one day incapacitated by epilepsy, feeble-mindedness and various types of mental illness, constitute a problem which is directly up to physicians to solve. Besides this huge problem, there is the problem of how to oppose the forces which tend to sap the vitality of men and women, destroy their initiative and break down individual character.

"The citizen of the United States in Revolutionary times was a hardy pioneer who had fought the forces of men and of nature successfully and who knew where he wanted to go and what he wanted to do," Dr. Sleyster pointed out. "Today the forces that have been developed by man as a result of modern invention in the field of both materials and of thought are so intricate and so great that frequently they are far beyond the ability of the average man to grasp. Hence bewildered, little men seek constantly for leadership without even sufficient data or background to determine whether or not the leadership is for good or evil."

It is the responsibility of the physicians and of the nation to see that, as a consequence of this situation, people do not pay too great a price, in breakdown of character, for security in old age, medical care and insurance against unemployment.

Granting that not all the people possess the benefits of "American life and living" which are enjoyed by the ma-

jority, Dr. Sleyster said that the same forces which brought us to our present high standards of health and living should enable us to extend these benefits to those who have not yet enjoyed them.

"To this purpose the American medical profession has repeatedly dedicated itself," he declared, adding that as president of the American Medical Association for the coming year he proposes to devote himself primarily to this task of "doing all that can be done to spread more widely the benefits of American life and living."

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Acne Helped by Vitamin D

EXCELLENT results in treating acne with vitamin D, the sunshine vitamin that cures and prevents rickets, were announced by Dr. Merlin T. R. Maynard of San Jose, Calif.

The treatment brought about satisfactory results in 75.6 per cent and 83.4 per cent, respectively, of patients in two groups. X-ray treatment, which is not always satisfactory in acne cases, was unnecessary when vitamin D was given.

Vitamin D was also helpful, Dr. Maynard reported, in treating other skin diseases such as alopecia areata, which is characterized by patches of baldness; scleroderma, in which the skin grows thick, hard and rigid; and a hardening of the skin from overdosage of X-rays.

Explaining the action of the vitamin, Dr. Maynard said that chronic inflammatory diseases such as these respond to agents like vitamin D which modify the calcium and phosphorus in the blood serum and the tissues.

Vitamin D is essential for normal utilization of calcium. Since the vitamin is found only in limited quantities in ordinary foods, the chief medical source has been cod liver oil.

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Sudden Deaths Explained

CASES of sudden death formerly labelled "acute indigestion" and more

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recently attributed to heart disease may be explained through the balloon-swallowing experiments reported by Drs. Lester M. Morrison and William A. Swalm, of Temple University, Philadelphia. More successful treatment of both heart and digestive disorders resulted from the findings, the Philadelphia doctors declared.

According to the balloon experiments, the sudden deaths may be due to distension of the stomach acting through the vagus or other nerves like a hair-trigger mechanism to cause sudden changes in the heart or its arteries. The changes may produce fainting, the severe pain of angina, and even sudden death with or without stoppage of the heart's arteries.

In the experiments, the tiny balloons were inflated after being swallowed. Two patients with angina pectoris and two with other forms of heart disease experienced severe distress as a result of the inflation. The attacks were promptly relieved by release of the gas in the balloons.

An intimate connection between the nerves of the digestive tract and those of the heart was shown, the Philadelphia doctors said, by the fact that consistent and analogous changes in the tracings of the heart's action were produced by blowing up the balloons in three of the four patients.

The results of the experiments apply especially, it was pointed out, to patients with angina pectoris who also have disorders of the stomach and intestines. Treatment for such patients, planned as a result of the experiments, consisted in giving antispasmodic drugs to quiet the nerves that are intimately related to the heart; a strict diet arranged to avoid foods tending to form gas; and instruction to the patients never to eat when tired or nervously distraught. Surprising improvement followed this plan of treatment, it was reported.

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Meerschaum Pipe Chemical

THE ESSENCE of a meerschaum pipe, a chemical known as hydrated trisilicate of magnesium, has been giving good results, in both England and the United States, as a remedy for stomach ulcers, Dr. Manfred Kraemer, of Newark, N. J., told members of the Association.

Out of a group of 90 patients with long standing, severe recurrent ulcers, 79 were benefited by the "seafoam" chemical used in making the pipes to which it gives its name, and 73 have been free of symptoms for periods ranging from three to eighteen months.

Advantages of this form of magnesium over other drugs used to combat acidity in ulcer cases were reported as follows: The chemical has no injurious effects and does not incite the intestinal tract to undue activity. Its acid-neutralizing action is gradual, which is valuable because acid is secreted in the stomach over a period of hours. It can probably remove acid from the ulcerated areas by absorption in addition to neutralizing acid in the stomach.

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Save Them if You Can

THE IMPORTANCE of pulling teeth and cutting out tonsils to prevent or cure ailments elsewhere in the body has been greatly exaggerated, Dr. Hobart A. Reimann, of Philadelphia, declared.

Ten years of this practice, as reported in medical literature, have failed to prove a relation between infection in teeth and tonsils, Dr. Reimann reported on the basis of a study by himself and his associate, Dr. W. Paul Havens.

The general idea of systemic disease arising from a focus of infection in one part of the body cannot be denied, he said. Such a relation exists in the case of boils that lead to blood poisoning. But the routine extraction of teeth or re-

moval of tonsils in the hope of influencing general systemic or remote disease is not warranted, he declared.

Even in the case of acute colds, inflammation of the inner ear, bronchitis and pneumonia, removal of the tonsils failed to lessen the attacks, one study of 1,000 children over a ten-year period showed.

A tooth should be removed when it is definitely beyond repair or if a chronic abscess is causing pain, swelling and other local symptoms, the Philadelphia doctors stated. Similarly, tonsils should come out when the patient is having repeated sore throat or if the tonsils are chronically inflamed. Aside from these conditions, their findings failed to show good reason for removal of teeth or tonsils.

Science News Letter, May 27, 1939

"Corpse Come to Life"

TAKING on permanently the appearance of "a corpse suddenly come to life" may be the fate of those who use nose drops containing silver, such as argyrol, or similar preparations, warned Dr. Ben L. Bryant, of Los Angeles.

The condition, characterized by a bronzed-blue or slate color of the skin that has been termed corpse-like, is known medically as argyria. It comes about from the chemical action of light on the silver which has deposited in the tissues following use of silver-containing drugs. Methods have been devised for determining the amount of silver that will cause argyria to develop, but no very successful methods for causing the discoloration to fade have been developed.

Science News Letter, May 27, 1939

GEOLGY

Bring Meteorite Fragments From Arabian Desert

Fragments of a meteorite that fell near Wabar in the Rub'al Khali, heart of the Arabian desert, and of silica glass formed by the hot blast as it struck, have been added to the collection of the Field Museum of Natural History. The specimens were brought out by an oil geologist, who visited the inaccessible site in 1937.

The silica glass is of peculiar interest because it is full of microscopic globular flecks of iron from the meteorite. The theory is that the heat of impact was so great that part of the iron and some of the desert sand were vaporized, and then condensed into the iron-impregnated glass.

Science News Letter, May 27, 1939

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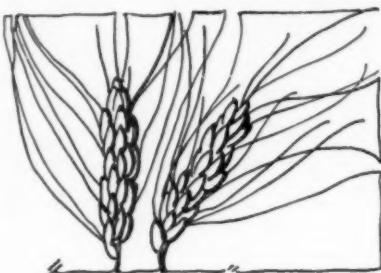
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SCIENCE NEWS



After Drought, What?

DROUGHT'S grip on the Great Plains seems to be slipping. Winter brought more snow, spring more rain; dust storms are only intermittent now instead of nearly incessant. A timid green creeps over the Dust Bowl. Farm families, who trekked in creaking jalopies to California, Oregon, anywhere to get away, are drifting back, and those who stayed are hoping to get off relief and "make a crop" for themselves again.

This return from exile gives land-use scientists a chance to grow some new gray hairs. If farm practices are renewed on the old basis, with the coming of a cycle of good rainfall, the Plains will be all set for another act of the same tragic drama when drought returns—as return it doubtless will, some day.

All of which makes timely a new WPA publication, *Farming Hazards in the Drought Area*, written by R. S. Kifer and H. L. Stewart of the Bureau of Agricultural Economics, U. S. Department of Agriculture.

Although they sedulously avoid dramatics and stick to unimpassioned facts and figures, the grief and misery that stalked the West during the nightmare of the mid-thirties crop out in spite of them, through the chill statistics of families on relief, debt loads, depletion of cattle through drought-forced sales, and so on.

Recommendations for rehabilitation necessarily vary from section to section, but in general the reformed land-use practices would include increasing the size of the farm units in the drier areas, taking wind-eroded soils out of plowed crops and putting them under permanent native grass sod, diversifying crops instead of putting almost exclusive emphasis on wheat, and above all develop-

ing a relatively small-scale, one-family livestock industry.

The report recognizes the necessity for financial assistance to farmers in accomplishing this program, as well as the fact that such loans will probably have to be government-backed. But no choice is seen between this and continued bankruptcy and misery for a whole major geographic section.

Science News Letter, May 27, 1939

From Page 325

Noise Reduction

NOISE reduction in business and industry is a splendid objective, but all too little attention has been given to the proper acoustical design of ear plugs which will enable the wearer to reduce markedly the bewildering irritating and potentially damaging "sea" of noise which surrounds industrial workers everywhere, said Prof. Vern O. Knudsen of the University of California at Los Angeles.

Most ear plugs on the market, Prof. Knudsen indicated, are designed more for swimmers than for hearers. In a systematic acoustical study of such devices Prof. Knudsen has been able to devise improved forms.

One "ear-defender," as the device is known, consists of a tapered rubber plug containing an outer plug of heavy metal and an inner plug of soft rubber. The two plugs, which for high insulation against sound should have inertness as large as possible, are coupled by means of an air space and the rubber walls of the tapered tube.

A fifty-decibel reduction in sound intensity is achieved with these new devices; a reduction equivalent to the change in sound intensity on a busy street to that in a quiet garden.

Just as grays, whites and blacks in the background of a painting may enrich the colors of the picture's main theme, so too will the music of the future be played against a background of synthetic tones which will enhance the music's main theme, Dr. Knudsen predicted.

These background "unpitched sounds" can be generated in a type of apparatus already developed—the Voder—which by electrical circuits can simulate a wide variety of natural sounds and even sounds which have never been heard before.

It is possible, suggests Prof. Knudsen, to use filters that will select tonal bands from these sounds which will form a harmonic series. By the musicians of the

future these sounds could be incorporated into music as background which will enrich the main theme melody.

Science News Letter, May 27, 1939

Buzz and Hiss Make Speech

A BUZZ and a hiss—that's all there is to human speech, even the smoothest sugary tones of a radio announcer.

Bell Laboratory scientists showed that a buzz and a hiss combine to give every inflection in the whole gamut of human speech. The buzz-hiss sounds mix and mingle in the throat and mouth and turn into intelligible speech.

The first sound, called the "buzz," has three properties. It has a pitch determined by the fundamental frequency of vibration; an intensity determined by the total sound power issuing from the speaker's mouth; and it has a quality determined by the relative amounts of sound power carried in various frequency bands. The second sound, the hiss, has no pitch whatever and is only a noise.

Homer Dudley demonstrated a new device—yet unnamed—which takes a spoken sentence apart and then puts it together in any fashion the scientists may desire. A young man's husky tones turn to those of a quavering old man, or to the pleadings of a lovelorn girl, at the twist of a dial.

Basically the new speech analysis instrument is like the Voder—now being shown at the World's Fair—but it is controlled by the speaker's voice rather than by keys.

Science News Letter, May 27, 1939

Buildings Shaped by Sound

BUILDINGS shaped by sound, rather than geometry alone, should add a strange new beauty to the architecture of tomorrow, J. P. Maxfield and C. C. Potwin of Electrical Research Products, Inc., asserted.

The demands for good hearing characteristics in auditoriums and concert halls have been so great that acoustical factors are influencing the appearance of new structures, they said.

The old method was to design and build a structure and then apply corrective acoustical tricks if needed for better hearing. Modern architects plan from acoustics first and find that the acoustical requirements often produce pleasing new shapes and contours.

Science News Letter, May 27, 1939

*First Glances at New Books

Medicine

HEALTH AT FIFTY—William H. Robey, ed.—*Harvard Univ.*, 299 p., \$3. Members of the faculty of Harvard Medical School prepared the lectures which make up this book of information and advice for the layman. The book is nontechnical and easy to read. The subjects covered include heart disease, blood pressure, cancer and rheumatism, and the several authors have described and explained latest developments in each of the fields. As the title indicates, the subjects are of especial concern to persons of middle age, but since sound health at age 50 has its foundations laid much earlier, the title should not discourage younger persons from reading the book.

Science News Letter, May 27, 1939

Sociology

WHO ARE THESE AMERICANS?—Paul B. Sears—*Macmillan*, 116 p., 60 c. The natural history of *Homo sapiens v. Americanus* seen through the eyes of an experienced ecologist and told in simple, straightforward English. Between the sociologist who ignores science and the demagog who at once overrates and falsifies science stands the true scientist who has a more definite knowledge of both its values and its limitations. And therein lies the beginning of wisdom.

Science News Letter, May 27, 1939

Physics

ELECTRON OPTICS—Otto Klemperer—*Cambridge (Macmillan)*, 107 p., \$1.75. The basic principles, methods and applications of electron optics for use by the student of experimental physics and the research worker who has not specialized either in geometrical optics or in electron physics.

Science News Letter, May 27, 1939

Astronomy

THE STORY OF ASTRONOMY—Arthur L. Draper and Marian Lockwood—*Dial Press*, 394 p., \$3. The assistant curators of the Hayden planetarium, New York City, tell the story of astronomy as they do in their lectures describing the heavens at the daily planetarium shows. Abundant illustrations are a feature of the book.

Science News Letter, May 27, 1939

Entomology

THE GENERA DERMACENTOR AND OTOCENTOR (IXODIDAE) IN THE UNITED STATES—R. A. Cooley—*Govt. Print. Off.*, 89 p., illus., \$1.25. Ticks used to be merely rather troublesome woodland

and brushland pests; now they are known as bearers of dangerous diseases. This manual gives their taxonomy (including synonymy), detailed description, with plates; distribution, with maps; host relationships. Invaluable alike to entomologists and public health workers.

Science News Letter, May 27, 1939

Nutrition

FOOD AND HEALTH—A. Barbara Calow—*Oxford*, 168 p., illus., \$1.75. This book by a leading English nutritionist, modestly subtitled "an introduction to the science of nutrition," purports to be a second edition, but it has been so much enlarged, particularly with recent developments in field of vitamins, that it can properly be regarded as a new work.

Science News Letter, May 27, 1939

Archaeology

AN ARCHAEOLOGICAL SURVEY OF WHEELER BASIN ON THE TENNESSEE RIVER IN NORTHERN ALABAMA—William S. Webb—*Govt. Print. Off.*, 214 p., 50 c. (See page 327)

Science News Letter, May 27, 1939

Agriculture

ELEVENTH INTERNATIONAL DAIRY CONGRESS HELD IN BERLIN, GERMANY, AUGUST 1937—Report of the Delegation of the United States to the Secretary of State—*Govt. Print. Off.*, 119 p., 15c.

Science News Letter, May 27, 1939

Architecture

THE 1940 BOOK OF SMALL HOUSES—Architectural Forum editors—*Simon and Schuster*, 239 p., \$1.96. Plans, photographs, specifications, interiors, and actual costs of 144 small houses.

Science News Letter, May 27, 1939

General Science

EXPLORATIONS AND FIELD-WORK OF THE SMITHSONIAN INSTITUTION IN 1938—*Smithsonian Institution*, 116 p., illus., free upon direct application to Smithsonian Institution, Washington, D. C.

Science News Letter, May 27, 1939

Agricultural Economics

CHANGING ASPECTS OF RURAL RELIEF—A. R. Mangus—*Govt. Print. Off.*, 238 p.; **RURAL FAMILIES ON RELIEF**—Carle C. Zimmerman and Nathan L. Whettan—*Govt. Print. Off.*, 161 p.; **FARMING HAZARDS IN THE DROUGHT AREA**—R. S. Kifer and H. L. Stewart—*Govt. Print. Off.*, 219 p. (See page 334). The three above books may be obtained only upon direct request from the Works Progress Administration, Washington, D. C.

Science News Letter, May 27, 1939

Genetics

YOU AND HEREDITY—Amram Scheinfeld—*Stokes*, 434 p., \$3.75. A highly readable book, written by a layman with the cooperation of many scientists. If you wonder why you look like Great-Aunt Sarah or whether it is safe for cousins to marry or what eugenics and sterilization of the unfit are all about, or whether your baby will inherit his father's keen mind, you will want to read this book.

Science News Letter, May 27, 1939

Engineering

UTILIZING HEAT FROM THE SUN—C. G. Abbot—*Smithsonian Inst.*, 11 p., 10c. "Both solar cooking and solar distilling of nonpotable water are practical and efficient propositions, which it is likely will be in common use before long if the necessary ovens can be produced at attractive prices."

Science News Letter, May 27, 1939

Plant Pathology

PLANT VIRUSES—Kenneth M. Smith—*Chemical Pub. Co.*, 107 p., \$1.25. A very small book on a very big subject, but it manages to pack into its few pages a great deal of information, some of which is not easily accessible elsewhere.

Science News Letter, May 27, 1939

Archaeology

TOOLS AND THE MAN—W. B. Wright—*Bell, London*, 236 p., 12 s. 6 d. An informative book for general reading and reference, designed to explain the Stone Age from the angle of its leading industrial activity. Dr. Wright shows how stone tools evolved and improved, and also relates the archaeological evidence to geologic events.

Science News Letter, May 27, 1939

Geography

THE SOUTH AMERICAN HANDBOOK, 1939 (15th ed.)—Howell Davies, ed.—*Wilson*, 714 p., \$1. Turned out in guide-book size, this volume tells what a fact-hunter is likely to want to know about each country from Mexico and Cuba southward. It includes information on public holidays, postal rates, railways, consulates, hints for travelers, natural resources, etc.

Science News Letter, May 27, 1939

Physiology

PHYSIOLOGY OF MUSCULAR ACTIVITY, 2d ed.—Edward C. Schneider—*Saunders*, 428 p., \$3.

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